Identifying and Prioritizing Effective Factors on Outsourcing in Public Hospitals Using Fuzzy BWM

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ABSTRACT

The outsourcing of health services has gained prominence over the past decades. Because numerous factors affect outsourcing in the field of health services, identifying and prioritizing these factors is specifically important. This study sought to identify and prioritize the factors affecting outsourcing, and to propose a model for the effective outsourcing of hospital services in Shiraz, Iran. The study drew on an exploratory mixed research method. In the first stage, all the criteria affecting the outsourcing of activities in hospitals were identified through the theoretical framework, a literature review, and interviews with hospital experts. Next, the criteria were finalized and prioritized using the fuzzy best-worst method (BWM). Following the literature review, 34 criteria for outsourcing were identified based on the studies explored and the interviews with the experts; the criteria were categorized into seven dimensions including "strategy", "management", "economy", "quality", "security and keeping patients' records", "service", and "agility." These dimensions formed the final outsourcing model of hospitals in Shiraz. Finally, the fuzzy BWM analysis revealed that "security and keeping patient's records" had the highest priority in outsourcing-related decision-making. The findings can help hospital managers make the right decision concerning the outsourcing of hospital services. The dimensions found in this research might also have been identified in other models, although this study was different in that it concentrated on the criteria in the specialized area of hospital management, while identifying the importance and weights of all the criteria involved.

KEYWORDS

Outsourcing; fuzzy best-worst method (FBWM); content validity; public hospitals

Introduction

The inefficiency of financing in developing countries has led health policy-makers to consider private services as an alternative option to reform the financial aspect of the health system. To accomplish this purpose, one of the interventions practiced is outsourcing services (Kavosi et al. 2018). Numerous studies have identified financing as a major driver of outsourcing (Kremic, Icmeli Tukel, and Rom 2006; Yang et al. 2007; Ferdosi et al. 2013; Lee 2017). Advocates of this strategy believe that outsourcing creates competition among suppliers, generating economic stimuli through the link between payment and service providers’ performance. Given these effects, proponents of outsourcing contend that it can improve the performance of services in the health system and lead to the promotion of health-related goals.

Comparisons show that in most cases executives tend to outsource services to decrease costs. Of course, while assigning services, executives must pay special attention to the specifications of services and make decisions with a due consideration of all aspects (Levery 2004). Such aspects include, among other things, regulatory concerns (Jannati, Mousazadeh, and Beyrami 2016), profit margin (Belcourt 2006), maintaining competitive advantage (Alvani and Ashrafzade 2004), increasing productivity (Lee 2017), reducing risk (Roberts 2001), increasing flexibility (Gandolfi 2009), as well as enhancing the quality of healthcare, increasing patient satisfaction, and reducing costs. The outsourcing of health services is a growing, strategic practice, and advanced countries have done pioneering work this field (Vining and Globerman 1999; Moschuris and Kondylis 2006; Tynkkynen, Lehto, and Miettinen 2012).
In the area of healthcare, the main outsourcable activities once included non-clinical services, as decision-makers were previously more conservative about the outsourcing of clinical services (Hayati et al. 2015). The reason for this is that hospital managers believed the outsourcing of clinical services would not save money and could even endanger patients (Kavosi et al. 2018). Young’s study showed that in Australia, only radiology and pharmacy wards were outsourced to the private sector (Young 2005). Although there is a rising growth in the outsourcing of nursing services to the private sector in the United States (Vining and Globerman 1999), in Taiwan less than 3% of the nutrition, pharmacy, and nursing sectors have been privatized (Hsiao, Pai, and Chiu 2009).

Yet, despite the benefits of outsourcing, the strategy could fail if not properly identified, designed, implemented and managed (Schniederjans 2007; Hsiao, Pai, and Chiu 2009). One of the main concerns of hospital managers is the choice of a service for assignment (Kavosi et al. 2018). Therefore, services should identify and consider all factors and conditions affecting outsourcing (Schniederjans 2007; Hassanain et al. 2015). Because numerous factors affect the outsourcing of a service within a complex process, identifying and prioritizing the factors would be a necessity. In doing so, multi-criteria decision-making (MCDM) techniques, including the best-worst method (BWM), can contribute to the process (Pourmohammadi et al. 2018).

The purpose of this study is to identify and prioritize the factors affecting the outsourcing of health-related services through the fuzzy BWM technique, and to construct a model for proper outsourcing in hospitals. BWM, a state-of-the art MCDM technique developed by Rezaei (2015) is used to investigate Zeinabieh Hospital, located in Shiraz, Iran.

This method requires fewer paired comparisons, while reducing the probability of inconsistency and providing more stable results (Rezaei 2015).

**Method**

This research relied on an exploratory mixed-method; in the first step the model was designed based on qualitative data, and in second step, the model was finalized and tested through quantitative data. Primarily, all the criteria affecting the outsourcing of activities in hospitals were extracted through a literature review and interviews with experts in the field of hospital management. Next, the criteria were finalized using the BWM. The data were collected according to a nonrandom, purposeful sampling method. Primarily, the experts in the field of outsourcing-related decision-making were identified. These included the hospital managers, the heads of the various management departments, as well as experts involved in the evaluation of hospital projects.

**Phase 1**

**Literature Review**

A number of databases and various search engines were utilized to review the relevant publications within 2000-2017. The keyword used in this procedure was “hospital outsourcing.” The reason only one keyword was searched was that this study exclusively focused on the factors affecting outsourcing. The search procedure also included articles in Persian sources up to 2017. The Persian databases investigated were SID and NOORMAGS, along with international databases such as ScienceDirect, Emerald INSIGHT, Pubmed, and SPRINGER. Finally, 18 relevant papers (articles) were selected. Then, the indicators affecting outsourcing were extracted through PRISMA and a content analysis of the papers selected. Figure (1) shows the PRISMA flow diagram for the paper selection procedure. Prisma’s statement, checklist and diagram have been endorsed by major scientific and international organizations worldwide such as Center for Reviews and Dissemination, Cochrane Collaboration, National Evidence-based Healthcare Collaborating Agency (NECA), Council of Science Editors and World Association of Medical Editors. (PRISMA 2015; Asar et al. 2016)

**Interviews**

Experts’ opinions were used in three phases. First, through the interviews, the most important
Factors affecting outsourcing in wards and units were identified, from the viewpoint of the expert panel at Zinabaye Hospital. This phase consisted of 5 experts who were hospital managers, experts in hospital administration, and specialists with a high degree of expertise in outsourcing. Second, the opinions of 12 experts, including university experts, medical staff, and administrative staff, were evaluated to measure the content validity of the indicators derived from the literature review and interviews. All experts have more than 10 years of work experience and their average age was between 30 and 45 years. Finally, 10 expert opinions (that were previously mentioned) were employed to determine the importance rates and weights of the indicators via fuzzy BWM.

This research was conducted in 2018. At the time the study was conducted, Shiraz Zinabaye Hospital was under the supervision of Shiraz University of Medical Sciences. It operated as a specialized gynecology and obstetrics hospital in Shiraz and had been recognized as the first infertility center in the Fars province as it launched the IVF center. The hospital included 6 floors, 162 approved beds, 173 active beds, 11 therapeutic units, and 7 paraclinic wards and units.

**Phase 2: Content Validity**

The content validity method was used to identify and select the most important factors in the outsourcing of Zinabaye Hospital departments. A questionnaire containing 34 criteria was designed and the experts were asked to determine the importance of each of the criteria. The content validity ratio calculated for each item based on the experts’ opinions was calculated through:

\[
CVR = \frac{(ne-N/2)}{N/2}
\]
where $ne$ is the number of experts indicating “essential” or “necessary” options, and $N$ is the total number of experts. As the number of the experts was 12, a CVR value greater than 0.56 was accepted (Ayre and Scally 2014). Moreover, based on the weighted CVR method, in cases where the CVR index was greater than 1.5, more than half of the experts would agree or strongly agree with the index. As a result, those indices with a CVR value less than 1.5 were omitted from the analysis.

**Fuzzy Best-Worst Method**

After the most important outsourcing dimensions and factors of the hospital departments were screened and identified, the fuzzy BWM was used to weight the criteria. The third questionnaire was developed and used to derive the weights of the criteria identified in the previous stage. In this stage, the opinions of 10 experts in the hospital management area were utilized for the weighting procedure. This MCDM method was first proposed by Rezaei (2015) and worked according to pairwise comparisons to obtain the weights of alternatives and criteria in crisp situations (Rezaei 2015). Guo and Zhao (2017) investigated the BWM model in a fuzzy environment and solved several examples using this model.

The use of fuzzy numbers could help to overcome the ambiguities in the respondents’ opinion (Guo and Zhao 2017). The weighting procedure was accomplished through the following stages:

**Step 1.** A set of decision criteria is determined as $\{C_1, C_2, C_3,..., C_n\}$;

**Step 2.** The best and the worst criteria are determined by the experts or the panel of experts. The best and worst criteria are represented by $C_b$ and $C_w$ respectively.

**Step 3.** The preference of the best criterion over all other criteria is determined using a number ranging from 1 to 5, which provides the best-to-others vector as:

$$A_B = (a_{b1}, a_{b2}, a_{b3},..., a_{bn}),$$

**Step 4.** The preference of all other criteria over the worst criterion is determined using a number ranging from 1 to 5, which provides the others-to-worst vector as:

$$A_W = (a_{1W}, a_{2W}, a_{3W},..., a_{nW}),$$

**Step 5.** The optimal weights ($w_1^*, w_2^*,..., w_n^*$) are found based on following model.

In this study, the optimal values ($W_1^*, W_2^*,..., W_n^*$) were obtained using Lingo software. Lingo is a programming language developed by LINDO Systems to solve operations research problems (Lingo version 11 was used to solve the problem).

$$\min \max \left\{ \left\{ \frac{W_B}{W_j} - a_{Bj}, \frac{W_j}{W_W} - a_{jw} \right\} \right\}$$

$$\sum_{j=1}^{l} R(W_j) = 1$$

$$l_{mj}^a \leq m^w_j \leq u^w_j$$

$$l_{mj}^a \geq 0$$

$$j = 1, 2, ..., n$$

Where $l_{mj}^a$, $m^w_j$ and $u^w_j$ denote the lower limit, the median and upper limit of the triangular fuzzy number of weights respectively.

**Results**

Following the review of the literature, 18 studies related to our research were identified through PRISMA. An exploration of these studies revealed 21 criteria associated with outsourcing. Furthermore, 13 criteria were identified through the interviews conducted with the hospital’s experts, who were 5 individuals including hospital managers, experts in hospital administration, and specialists with a high degree of expertise in outsourcing. The content validity of these criteria was then conducted. Based on the viewpoints of 12 panels, including university experts, medical staff, and administrative staff, 20 criteria were approved and 14 criteria were rejected. These indicators are listed in Table 1. These 20 indicators were categorized into 7 dimensions based on the literature and the opinions shared by the expert panel. The interviews revealed 9 indicators (out of the total 20 indicators) which were not previously reported in other studies. Consequently, 7 dimensions, including “strategy”, “management”, “economy”, “quality”, “security and keeping patients’ records”, “service”, and “agility”, along with 20 criteria, were selected as...
the constituents of the final model of outsourcing of Zinabaye Hospital in Shiraz. Table 2 illustrates this model.

**Weighing the Criteria Affecting Outsourcing through Fuzzy BWM**

After the factors affecting decision-making in terms of outsourceable activities were identified, the significance of each factor was determined. In this study, the fuzzy BWM was used for this purpose, the results of which are described below. First, the data were analyzed through triangular fuzzy numbers. To this end, the experts' opinions were integrated into a matrix. The numbers of each of the matrix cells were as follows: the minimum number of expert opinions was considered to be as the smallest likely value, the mean of the opinion of the experts was regarded as the most probable value, and the maximum of the expert opinions was seen as the largest possible value (Table 3). Finally, in the light of the factors influencing the outsourcing process, all factors were prioritized, as in Table 4.

**Discussion and Conclusion**

Today, the selection of outsourceable services has become one of the main challenges facing senior healthcare administrators. It would, therefore, be necessary to examine the factors affecting the outsourcing process when determining outsourceable services. The reason for this is that factors affecting outsourcing-related decision-making...
evaluate the performance of the organization and help the organization to select outsourcing or non-outsourcing departments (Salla et al. 2013). Concerned with these issues, this study sought to identify and prioritize the importance of the factors influencing the decision-making of outsourceable services in hospitals.

The results of the study showed that this mode of decision-making was a multidimensional and complex process. According to these findings, decision-makers concerned with the outsourcing of hospital services must take into account economy, service, management, strategy, security and keeping patients records, quality and agility. In the following sections, these factors are elaborated on.

### Economy

The key driver for most outsourcing-specific decisions is to reduce labor costs, materials, and resources. Increasing the costs of an activity in an organization increases the likelihood of outsourcing compared to expected outsourcing costs. Outsourcing helps the organization to convert fixed costs (e.g. labor costs and infrastructure) into variable costs (Al-Nehmi 2009; Kavosi et al. 2018). Reducing workforce through outsourcing will require fewer infrastructural and support systems. As such, funds are injected into the organization, improving the cash flow through outsourcing. The necessity of investing in major activities makes the organization outsource and

### Table 3. Final weight of effective factors on outsourcing decision making.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Final weight of dimensions</th>
<th>Factors</th>
<th>Relative weights of factors</th>
<th>Final weights of factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(0.53, 0.69, 0.177)</td>
<td>AA1</td>
<td>(0.491, 0.493, 0.513)</td>
<td>(0.035, 0.060, 0.087)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AA2</td>
<td>(0.486, 0.506, 0.508)</td>
<td>(0.026, 0.033, 0.089)</td>
</tr>
<tr>
<td>B</td>
<td>(0.115, 0.125, 0.163)</td>
<td>BA1</td>
<td>(0.108, 0.114, 0.174)</td>
<td>(0.012, 0.014, 0.028)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BA2</td>
<td>(0.113, 0.123, 0.205)</td>
<td>(0.013, 0.015, 0.033)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BA3</td>
<td>(0.140, 0.157, 0.193)</td>
<td>(0.016, 0.024, 0.025)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BA4</td>
<td>(0.102, 0.117, 0.161)</td>
<td>(0.011, 0.014, 0.026)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BA5</td>
<td>(0.134, 0.178, 0.290)</td>
<td>(0.020, 0.021, 0.036)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BA6</td>
<td>(0.121, 0.139, 0.168)</td>
<td>(0.013, 0.017, 0.027)</td>
</tr>
<tr>
<td>C</td>
<td>(0.108, 0.118, 0.216)</td>
<td>CA1</td>
<td>(0.152, 0.169, 0.293)</td>
<td>(0.016, 0.019, 0.063)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CA2</td>
<td>(0.045, 0.055, 0.298)</td>
<td>(0.004, 0.006, 0.064)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CA3</td>
<td>(0.064, 0.083, 0.226)</td>
<td>(0.006, 0.009, 0.048)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CA4</td>
<td>(0.063, 0.090, 0.217)</td>
<td>(0.006, 0.010, 0.046)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CA5</td>
<td>(0.046, 0.056, 0.183)</td>
<td>(0.005, 0.006, 0.039)</td>
</tr>
<tr>
<td>D</td>
<td>(0.026, 0.097, 0.153)</td>
<td>DA1</td>
<td>(0.026, 0.097, 0.153)</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>(0.075, 0.109, 0.146)</td>
<td>EA1</td>
<td>(0.075, 0.109, 0.146)</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>(0.075, 0.094, 0.186)</td>
<td>FA1</td>
<td>(0.140, 0.164, 0.325)</td>
<td>(0.010, 0.015, 0.060)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FA2</td>
<td>(0.187, 0.189, 0.208)</td>
<td>(0.014, 0.019, 0.035)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FA3</td>
<td>(0.175, 0.259, 0.276)</td>
<td>(0.013, 0.024, 0.051)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FA4</td>
<td>(0.145, 0.197, 0.324)</td>
<td>(0.010, 0.018, 0.062)</td>
</tr>
<tr>
<td>G</td>
<td>(0.056, 0.075, 0.146)</td>
<td>GA1</td>
<td>(0.056, 0.075, 0.146)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4. Final rank of effective factors on outsourcing decision making.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Factors</th>
<th>Final weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Security and keeping patients records</td>
<td>0.1280</td>
</tr>
<tr>
<td>2</td>
<td>Customer satisfaction</td>
<td>0.1225</td>
</tr>
<tr>
<td>3</td>
<td>Enhancing the responsiveness to change of stakeholder needs</td>
<td>0.1191</td>
</tr>
<tr>
<td>4</td>
<td>Influence on the attaining hospital strategic and operational plans</td>
<td>0.0691</td>
</tr>
<tr>
<td>5</td>
<td>Influence on the achievement of organizational goals</td>
<td>0.0681</td>
</tr>
<tr>
<td>6</td>
<td>Improving hospital cash flow</td>
<td>0.0478</td>
</tr>
<tr>
<td>7</td>
<td>Providing facilities and easier access for patients</td>
<td>0.0460</td>
</tr>
<tr>
<td>8</td>
<td>Cost reduction</td>
<td>0.0443</td>
</tr>
<tr>
<td>9</td>
<td>Development of hospital service capacity with the help of contractor facilities</td>
<td>0.0441</td>
</tr>
<tr>
<td>10</td>
<td>Decreasing working process time</td>
<td>0.0401</td>
</tr>
<tr>
<td>11</td>
<td>Fitting to resilience economy pattern</td>
<td>0.0345</td>
</tr>
<tr>
<td>12</td>
<td>Increasing hospital efficiency</td>
<td>0.0333</td>
</tr>
<tr>
<td>13</td>
<td>Solving supply problems of that section</td>
<td>0.0288</td>
</tr>
<tr>
<td>14</td>
<td>Improving hospital productivity</td>
<td>0.0278</td>
</tr>
<tr>
<td>15</td>
<td>Decreasing the administrative burden of hospitals</td>
<td>0.0266</td>
</tr>
<tr>
<td>16</td>
<td>Possibility of supervision</td>
<td>0.0233</td>
</tr>
<tr>
<td>17</td>
<td>Improving performance and suitable usage of resources</td>
<td>0.0233</td>
</tr>
<tr>
<td>18</td>
<td>Improving administrative health and reducing corruption</td>
<td>0.0230</td>
</tr>
<tr>
<td>19</td>
<td>Improving management and control of that section</td>
<td>0.0230</td>
</tr>
<tr>
<td>20</td>
<td>Supporting of domestic products</td>
<td>0.0215</td>
</tr>
</tbody>
</table>
reduce capital budgets of other activities (Djavanshir 2005; Al-Nehmi 2009).

Therefore, an outsourced activity is expected to reduce costs compared to the scenario in which the organization itself performs the activity. Yet, although organizational activities may be outsourced for economic reasons, there is no guarantee that expected savings will occur. There is some evidence suggesting that no cost saving may even take place (Kremic, Icmeli Tukel, and Rom 2006). For instance, Ferdosi and colleagues' findings indicated that following outsourcing, the cost of each hospital bed and ultimately the total cost increased (Ferdosi et al. 2013). Furthermore, some indirect costs may be imposed on the organization through outsourcing, as a result of contract costs, contract control, absenteeism, and less efficiency (Kremic, Icmeli Tukel, and Rom 2006).

**Services**

One of the important reasons for organizations to outsource their services is to develop and improve services. Thus, the level and mode of services provided by contractors must be assessed prior to outsourcing. This study found four service-related impacts: (a) developing of hospitals' services capacity through contractors' facilities; (b) solving supply problems of a given section; (c) decreasing the working process time; and (d) providing facilities to patients and simplify access for them. Some studies have categorized service as part of management (Al-Nehmi 2009; Kavosi et al. 2018); in this study, however, this factor was considered to be an independent dimension.

Mehdizadeh et al. highlighted the speed of providing services and responding to patients as one of the outsourcing benefits in hospitals (Mehdizadeh et al. 2016). Reducing the scheduling time of activities is an important objective for any organization, while the outsourcing of services could contribute to the achievement of this goal as an effective strategy. By assigning low-priority activities, the organization can focus on the mainstream ones (Djavanshir 2005). Hsiao et al. also suggested that outsourcing could help reduce workload and enhance the energy of hospital management personnel (Hsiao, Pai, and Chiu 2009).

**Management**

Management factors include the ones affecting performance and service management. Managers are elements that affect performance and service management. In the present study, the management dimension for outsourcing hospital services included 6 factors: improving management and control of a given section, decreasing the administrative burden of hospitals, providing the possibility for supervision, supporting domestic products, improving performance and suitable usage of resources, and improving administrative ethics and reducing corruption.

Nevertheless, other studies took account of some other criteria as well, such as saving time management, reducing workload management, increasing the speed of implementation, improving safety management, improving accountability, the need for specialized management, and the difficulty of managing performance. (Al-Nehmi 2009; Kavosi et al. 2018). In fact, the plurality of management variables highlights the breadth and importance of the management dimension in the outsourcing process, which should be given sufficient attention.

**Strategy**

Outsourcing, as a strategy, enables the organization to gain more advantages as far as long-term goals are concerned. The findings of this study showed that the impact on the achievement of organizational goals (4th priority) and the impact on the realization of hospital strategic and operational plans (5th priority) were important in making decisions for outsourcing a service. Assaf et al. observed that the focus on the core activity and releasing the resources for the core activity were two strategic issues affecting outsourcing decision-making (Assaf et al. 2011).

Although in this study the strategic factor showed the 4th priority in outsourcing-related decision-making, in general the main drivers of outsourcing are becoming more strategic than economic. The reason for this is that strategic incentives allow the organization to focus on its core capabilities and long-term goals. On the other hand, due to competition, organizations are
forced to direct their domestic, scarce resources to core activities that are more effective (Kremic, Icmeli Tukel, and Rom 2006; Hassanain et al. 2015). For instance, Khanian focused on the main activity as the most influential factor in other decision-making criteria for the outsourcing of hospital services (Khanian 2016).

Another strategic issue that encourages outsourcing is flexibility. Kremic et al. pointed out that organizations needed to be flexible about and responsive to customers’ needs, and that outsourcing could facilitate and help achieve organizational goals (Kremic, Icmeli Tukel, and Rom 2006). Moreover, hospital managers should carefully consider the legal and regulatory implications of outsourcing in order to reach organizational strategic and operational goals and objectives (Liu, Hotchkiss, and Bose 2007).

Quality

One of the goals of outsourcing in most organizations is quality improvement (Foxx, Bunn, and McCay 2009; Oduk 2013). In this study, the experts selected “customer satisfaction” as a quality-related variable, which was the second most important factor (with final weight 0.1225) affecting outsourcing. The findings of Akbulut et al. showed that outsourcing in 38.8% of studies affected services quality improvement, and in 27.7% of studies it left an impact on productivity and efficiency (Akbulut, Terekli, and Yıldırım 2013). Assessing and monitoring the quality of outsourced services is one of the factors affecting the effectiveness and efficiency of outsourcing strategies. Therefore, to ensure and improve the quality of outsourced services, monitoring and control mechanisms must be necessarily implemented (Ferdosi et al. 2013). Improving the quality of services through outsourcing can increase patients’ and other stakeholders’ satisfaction, while reducing cost (Al-Nehmi 2009; Oduk 2013).

Security and Keeping Patient’s Records Factor

The results of the study revealed that “security and keeping patient’s records” had the highest priority in outsourcing-related decisions. Most studies showed that economic factors were the main impetus behind decisions about outsourcing activities (Young 2005; Kremic, Icmeli Tukel, and Rom 2006; Mehdizadeh et al. 2016; Lee 2017). The results of the study, however, showed that the highest outsourcing priority at Zainabiyah Hospital was “security and keep patients information and related services.” Security and keeping information represent important facets in outsourcing projects (Al-Nehmi 2009). Therefore, in order to protect patients’ information, it is necessary to verify all aspects of security during outsourcing. Low and Chen found security an evaluation criterion in the outsourcing process when selecting a contractor of hospital information systems (Low and Chen 2012).

Agility

Agility had the lowest priority in outsourcing-specific decisions as confirmed through the analysis conducted in this study. However, this factor had an important impact on the outsourcing of hospital services. The criterion of this dimension in the outsourcing model was “enhancing the responsiveness to change stakeholder’s needs.” One of the issues facing today’s health systems, especially in hospital management, is the uncertain environment and rapid changes that affect hospitals’ success. Given this issue, flexibility and agility in health organizations are very valuable specifications (Pipe et al. 2012). Agility involves a quick and effective response that brings about customer satisfaction (Mason et al. 2002).

Thus, another factor that demands consideration in the outsourcing process is agility/flexibility. Kremic et al. stated that organizations need flexibility and agility in response to the needs of their customers, which is a demand that can be facilitated through outsourcing. Admittedly, flexibility can simultaneously engender positive and negative effects in outsourcing decisions (Kremic, Icmeli Tukel, and Rom 2006).

This research was conducted to shed more light on the decision-making process of outsourcing services, by investigating Zainabiyeh Hospital, Shiraz, Iran. The study demonstrated that the decision to outsource hospital services was a complex and multi-criteria problem. As a result, when managers decide to outsource hospital services, they
must pay attention to various factors. The findings of this study can help managers make proper decisions with respect to the outsourcing of hospital services. This study pointed out several dimensions, and although they might have been proposed in previously published models, the model in this study specifically focused on factors in the specialized domain of the topic addressed. That is, other models considered the outsourcing indicators in general.

Furthermore, in terms of the analysis method used, the results of this research were observed in a fuzzy environment. This research, more specifically, relied on the fuzzy BWM decision-making technique to weight and prioritize the factors under investigation. Fewer pairwise comparisons in the BWM decision-making process would provide more accurate and correct results. As the weighting and prioritization of the criteria showed, "security and keeping patients' records", "customer satisfaction", "enhancing the responsiveness to change stakeholders’ needs", and "the impact on the realization of hospital strategic and operational plans" were respectively the most important indicators of outsourcing.

Of course, this research, like other studies, had its limitations in terms of implementation. The most important limitation of this study was the statistical population. One way to increase the generalizability of the findings is to investigate all hospitals in Shiraz city. At least in this study, the population was restricted to Zeinabieh Hospital, due to cost problems, time pressure, and the inaccessibility of Shiraz hospitals’ data. Moreover, this study is exploratory and dependent on the information that is provided by experts. As a consequence, the results of this study may not be applicable in all situations, and their findings should be generalized with caution. In addition, the difficulty of completing a pairwise comparisons questionnaire is another limitation of implementing techniques such as FBWM.

Furthermore, although this study was conducted as a response to a request made by Zeinabieh Hospital in Shiraz, some experts could not manage to complete their copies of the questionnaire because of the perceived difficulty of completing the fuzzy BWM structure used in this study; this issue wasted much of the time devoted to the study. Authorities making outsourcing-related decisions at Zeinabieh Hospital are advised to consider in the future the indicators when outsourcing the hospital’s activities. Meanwhile, interested researchers can explore outsourcing in other hospitals to identify the weaknesses of the existing outsourcing systems and to derive reliable and more comprehensive results to construct a strong framework for decision-making in this area. The results of the fuzzy BWM can also be analyzed and evaluated through other weighting techniques such as fuzzy ANP.

References


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